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Recent research by Falcon, Hayami, Mellor, Ruttan, Schultz, Timmer, and others have made it clear that agricultural development is important and that new technologies, price incentives, and supporting infrastructure are its primary determinants. This work has convinced most policy makers that farmers respond to production incentives.

Given this, it is surprising how few traditional views about rural financial markets (RFMs) have changed. While farmers are acknowledged to be rational in reacting to product and input prices, they are thought to be unresponsive to changes in deposit incentives, and to need low--even negative--real interest rates on loans. Also, while it is widely acknowledged that food price controls benefit consumers and damage producers, it is not generally recognized that low interest rates unfairly benefit borrowers at the expense of depositors. Likewise, it is widely recognized that low farm prices and lack of public investment in agriculture lessen incentives for those who create new farm technologies, but little is said about how repression of rural financial markets affects discovery of cost-reducing financial technologies.

Traditional views permeate policies, practices, and projects in RFM in most countries outside of East Asia. In the following discussion we argue that many of these views are incorrect, that RFMs are asked to do tasks for which they are ill suited, and that this misuse of RFMs substantially increases the transactions costs therein and distorts and discourages the discovery of new

financial technology that would make RFMs operate more extensively, efficiently, and equitably.

We also argue that transactions costs are excellent measures of how well RFMs are working and that policy makers ought to be as concerned about encouraging cost-reducing innovations in service industries such as RFMs as they are in stimulating new agricultural technologies. Further, we argue that RFMs will only provide reliable services to a large number of rural people if these costs are reduced through innovations. RFM innovations, in turn, are largely determined by the extent of the market. Financial repression forces financial markets to contract, which, in turn, reduces the extent of formal financial intermediation and lessens the impetus for cost-reducing innovations.

#### Role of RFMs

Before discussing innovations and transactions costs in more detail it is useful to review the contributions of RFMs to development.

Numerous governments attempt to use RFMs as fiscal agents to dispense subsidies, via concessionary or soft loans, to particular groups (Von Pischke). Cheap credit for small farmers, land reform participants, or for those affected by various natural disasters are examples of this. Credit programs that pay little attention to loan collection also transfer subsidies. In addition, most countries attempt to step up the pace of agricultural development by targeting concessionary loans for selected investments, products, inputs, or regions.

Recent research is showing that using RFMs for these two purposes achieve much less than policy makers hoped and also cause damaging side effects. Because the subsidy associated with a loan is always proportional to the size of the amount borrowed, the benefits from cheap credit are largely captured by

those who have the most access to loans--the well-to-do. At the same time, all savers who wish to hold deposits, especially the poor, are penalized by the low interest rates forced on deposits because of the cheap loans. The well-to-do can often avoid these low returns on deposits by holding their assets in other forms. As a result, RFMs distribute subsidies regressively. Differentially low interest rates on loans for the poor exacerbate this process by further discouraging intermediaries from making concessionary loans to clients who are the most costly to service per unit of money lent.

Research is also showing that targeted loans have less effect on borrower behavior than anticipated. In many cases loans are targeted by policy makers because other incentives are weak for the preferred activity. But, because borrowed funds are fungible (interchangable), they are used for the purpose deemed most desirable by the borrower, regardless of the policy maker's priorities. The investment priorities of the borrower and policy maker will only coincide when the borrower expects the targeted activity to be the most rewarding of all alternatives available. At the same time, if, because of relatively high yields and prices, the targeted activity ranks high on most farmers' marginal investment list, targeted loans are not necessary to convince them to allocate additional funds to this activity. Likewise, when the returns on the targeted activity are relatively low the targeted loans will have no effect on the relative profitability of the targeted activity or on the marginal investment decisions made by the borrower.

While not widely recognized, rural financial intermediation is expensive: participants are geographically scattered, financial transactions are small, rural incomes tend to be unstable, clearly defined collateral is often not available, rural people are usually less well educated than urban people, and

it is costly to collect information about rural borrowers. These substantial costs naturally impede financial markets from making contact with rural people, especially the poor. As will be discussed in more detail later, loan targeting and use of RFMs as fiscal agents substantially increase these costs and force RFMs to contract, rather than to expand, their services. This contraction results in RFMs doing less intermediation between surplus and deficit units. This, in turn, results in resources being less efficiently allocated in rural areas, a role that only an integrated and extensive RFM can perform. It is this important role that is usually ignored by governments trying to target loans or to transfer subsidies through loans. The unfortunate side effect of many of these policies is an increase in the transactions costs of RFM participants, which, in turn, further constricts the coverage of the formal financial system--especially for non-preferred clients. This is the exact opposite of what policy makers intended.

#### Types of Transactions Costs

There are four categories of transactions costs: the costs incurred by borrowers in getting loans, the costs of savers making deposits, the intermediary's costs of making loans, and the intermediary's costs of accepting and maintaining deposits. These costs are above and beyond the interest payments made by borrowers and changes in the purchasing power of loans due to inflation.

Borrower transactions costs include expenses of visiting the lender several times to negotiate a loan, paying bribes, covering the costs for paperwork, and incurring the opportunity cost of time spent negotiating the loan. While generally smaller, some of the same types of costs are encountered by depositors, especially those living long distances from the intermediary.

Lenders incur both fixed and variable transactions costs. Buildings, personnel, and vehicles cause most of the fixed expenses. Collecting information about the borrower, securing collateral, maintaining loan accounts, providing information to governments and donors about targeted lending, and loan collection contribute to variable costs. On the deposit side, the intermediary must again cover a portion of its fixed costs, maintain accounts for accepting deposits and allowing withdrawals, and handling the liquidity management problems involved in balancing deposits and loans.

#### Allocation of Transactions Costs

One might expect total transactions cost in RFMs to be allocated in fixed proportions among participants. Recent research, however, has shown that the allocation of these costs among the four categories of participants, among individuals within each category, and the total amount of these costs are dependent on financial market policies (Ladman). Further, research is showing that intermediaries transfer, absorb, or in some cases increase transactions cost incurred by various classes of individuals as a rationing device, depending on whether they are preferred or non-preferred clients (Cuevas and Graham).

Lenders often allocate transactions costs to ration financial services when financial markets are repressed by interest rate restrictions. Because of the inability to use interest rates to ration intermediary services under financial repression, intermediaries reallocate transactions costs and adjust collateral requirements to increase the effective costs for non-preferred clients, while, at the same time, reducing the effective costs for preferred clients. This leads to a false sense of control among policy makers who

manipulate interest rates, but who cannot control the allocation of transactions cost, and thus cannot control the effective costs of borrowing.

Several examples of how reallocations of transactions costs are used to encourage or discourage the demand for an intermediary's services, sometimes inadvertently, may clarify this important point. In the mid-1980s the Development Finance Corporation (DFC) in Belize only had one employee in its Punta Gorda office. Because of concessionary interest rates, there were always requests for DFC loans in excess of the funds available, particularly at planting time. As a result, it was common for small farmers who lived 20-30 miles away from the DFC office to pay for a truck ride to town (leaving at 5 a.m.), then stand in line for 4-5 hours in front of the DFC office, only to have it close for the day at 11 a.m., before the farmer had even gotten a loan application (MUCIA).

Small farmers repeated this process an average of 6-7 times before they got a loan application, filled them out, had the loan approved by the local officer, returned to see if the head office in the capital city had approved the loan, gotten loan disbursement, and repayed the loan. At the same time, large farmers who lived in town were able to meet the DFC official at the borrower's convenience and negotiate an extension of their borrowing arrangements in a matter of minutes. While both the small and the large borrowers paid the same rates of interest on their loans, the effective-borrowing-cost rate for the small farmer, when borrower's transactions costs were included, were 3-4 times that of the large borrower. Because of the high transactions costs imposed on small borrowers, many of them found it cheaper to borrow from informal lenders who charged up to 4 percent per month for loans.

By way of contrast, the Grameen Bank in Bangladesh sends its employees into villages to both make and recover loans, thus reducing borrowers' transactions costs while elevating the costs of the bank (Sadeque). The use of "barefoot bankers" in Sri Lanka and building small branches of commercial banks in villages in Bangladesh have had the same effect of transferring transactions costs from borrowers and depositors to the intermediary.

On the deposit side, commercial banks in Kenya have required depositors to keep a large minimum balance as a way of discouraging small depositors. Some financial intermediaries in Africa have gone so far as to tax small savings accounts as a way of eliminating them, while granting special privileges to large depositors. In sharp contrast, mobile banks in some areas of the Philippines visit remote villages on a regular basis to accept deposits, thus decreasing depositors' transactions costs while increasing those of the intermediary. It is common for post offices in parts of Africa to require depositors to request withdrawals a week or so in advance, while a cooperative bank in Peru opens its deposit window during the evening and on weekends to make it more convenient for its depositors who are in town to shop or to attend church.

#### Policies and Transactions Costs

It is useful to divide RFM transactions costs into two categories: normal costs resulting from the operations of RFMs, and additional costs imposed on these markets by government actions. Normal transactions costs tend to be high for RFM participants because of the nature of the transactions handled; the relatively high interest rates charged in informal RFMs are reflections of these costs. Imposed transactions costs are often also high because RFMs are heavily regulated and repressed by governments. Because normal and imposed



transactions costs have different parentage, their reduction or elimination require separate strategies.

Normal transactions costs, per unit of service handled, decline as RFMs expand and realize economies of both scale and scope. Policies that affect the creditworthiness and savings capacities of RFM clients, along with restrictions on the range of services that RFMs can provide condition how quickly these economies are realized. These policies also affect the returns that intermediaries expect from innovations aimed at reducing normal transactions costs, and thus the pace at which these innovations are created. If incomes and the rates of return on agricultural investment are low and unstable, the development of new RFM technology will be retarded.

Various financial market policies, such as loan targeting, impose additional costs on RFMs and distort financial innovations. Extensive loan targeting is usually done through multiple rediscount lines in central banks, each with different terms, target group or activity. Even in small countries such as the Dominican Republic and El Salvador this may result in agricultural banks trying to manage two or three dozen discount lines. In extreme case, such as Indonesia during the late 1970s, these concessionary and targeted discount lines may run into the hundreds. Typically, the reporting requirements attached to these targeted loans substantially increase all participants' costs of effecting financial intermediation. Ebbs and flows in the funding of these lines further increase the average costs of intermediation, as intermediaries must increase their staff to handle peak flows of funds and then find they are overstaffed between surges of external money.

Typically, loan targeting is accompanied by increased reporting requirements to the provider of the targeted funds. A targeted agricultural credit program in Tunisia, for example, required farmers to fill out seven copies of exhaustive loan applications. Copies of these applications were sent to five other decision-making bodies before loans were approved or rejected.

In Bolivia, various targeted loan programs for farmers required them to fill out multiple copies of loan application forms that ran to 15 pages in length, small print. Copies were then sent to regional offices and also the main office of the Central Bank for final approval. The better part of one large floor of the Central Bank building was stacked to the ceiling with these loan application forms. Numerous Central Bank employees shuffled through these forms, attempted to keep them in some order, and were kept busy filling out monthly, quarterly, semi-annual, and annual reports on more than two dozen targeted lines of credit funded by government and various donors. The government and donor offices that administered the targeted loans spent time in filing these reports as they came in from the Central Bank, but it is unlikely if anyone read these reports or made decisions based on the information contained therein. Reducing these types of imposed transactions costs will require changes in financial market policies.

Under these conditions, instead of attempting to lower the normal costs of financial intermediation, financial innovators find it more rewarding to mine loopholes in, or to do end runs on, RFM regulations. These evasive innovations benefit the intermediary, but often result in the total transactions costs in RFMs increasing and coverage of these markets to shrink. An example of this is the government setting loan-size limits on an agricultural bank in attempts to force it to make more cheap credits available to farmers with small units.

Intermediaries may not feel it is in their interest to comply with the intention of the policy maker and evade the intent by innovating and making multiple small loans to preferred borrowers. This raises the lender's as well as borrowers' transactions costs

Likewise, intermediaries who lend or mobilize funds mostly for donors and central banks often end up providing only a single financial service to clients. A development bank may only extend medium- and long-term loans; a cooperative may only provide short-term production loans; and, postal savings units may only accept deposits. While there is need for specialization in RFMs, large measures of this should not occur until these markets are fairly well extended. In most cases this extreme specialization is forced on financial markets by government or donor policy. One of the main losses from this is that intermediaries are unable to realize scope economies: the lessening of average costs that comes from providing more than one service. These losses are especially important where the making of loans and the accepting of deposits are divorced institutionally. For example, an intermediary collects valuable information about potential borrowers by observing their savings behavior as seen through deposit activities (Vogel).

#### Financial Innovations

Financial markets typically attract innovative people, but there has been little systematic research done on the technology they generate (Barras). While the process of financial intermediation is simple--mobilizing deposits from surplus units and allocating loans to creditworthy deficit units--the options and terms for carrying out this intermediation are essentially infinite in number; there is extensive substitutability among financial instruments and

large numbers of relatively small transactions in RFM that are susceptible to being done more efficiently.

Unlike the rice breeder, who must build new varieties from existing strains, a creator of new financial products or processes can invent with pen and paper. Likewise, given the proper environment, financial innovation can emerge in many parts of the system, not mainly from publicly-funded research centers (Bhatt). Furthermore, once a new financial technology is discovered, its diffusion is often rapid because of the low initial costs of adoption.

Financial innovations are discovered mainly by managers, not researchers. These innovations are a natural outcome of attempts by managers to minimize their transactions costs. The institutions, in turn, are social innovation aimed at reducing the overall costs of effecting financial intermediation (Williamson). For many inventions, the "stimulus is a technical problem or opportunity conceived by the inventor largely in economic terms, that is in terms of costs and revenues" (Schmookler, p. 66).

A few examples may be useful to illustrate financial innovations. All RFM intermediaries encounter relatively large transactions costs when they attempt to make small loans to borrowers who are poor, who are new clients, and who do not have secure collateral for their loans. In attempts to reduce the transactions costs of making these loans, lenders in places as diverse as Nepal, Thailand, Bangladesh, the Philippines, the Dominican Republic, Bolivia, and Ghana have experimented with group loans (Adams and Ladman). In Pakistan, lenders provide borrowers with pass books that are an easily-handled record of land title as well as borrowing and repaying performance. These books reduce both the lender's and borrower's transactions costs of negotiating loans. Forced savings programs in credit unions, in the Grameen Bank in Bangladesh, in

a Malawi credit program sponsored by the World Bank, and in group lending activities in Nepal are all aimed at reducing intermediaries' transactions costs of securing loan collateral.

Often informal financial intermediaries create cost-reducing innovations at a faster pace than formal intermediaries. Market higgler in Jamaica, for example, developed a system whereby they postponed paying farmers for their products until after the higgler received payment for the goods in the city. This resulted in the higgler being financed by the farmer without any formal loan documents. The pledging of cocoa trees as collateral for informal loans in Nigeria, transfer of land usufruct rights to lenders by borrowers of informal loans in Colombia, and the rich variety of rotating savings and credit associations (ROSCAS) around the world are examples of creative finance (Bouman).

#### Innovations and ROSCAS

ROSCAS merit special attention because they are so common in LDCs, have such a wide range of adaptations, and are surprisingly dynamic (Nayar). They also illustrate how innovative people can be who are involved in financial intermediation, given appropriate conditions. In its simplest form, a ROSCA is formed by a small group of individuals who agree to contribute a given amount of money or commodity periodically to a pot. The distribution of the pot is done in rotation to members of the group. For example, a 10-member group that made contributions of \$10 each to a monthly pot, would result in each member getting \$90 from other members at the time they received the pot, and the ROSCA'S cycle being completed in ten months. Those who get the pot early are borrowing from those who come later in the rotation and are net savers.

As an aside it is surprising how often ROSCAS are found among employees of formal financial intermediaries. Many of the employees of the National Credit Union Federation in Chocabamba, Bolivia, for example, are members of ROSCAS. Many of the employees of commercial banks and the Central Bank in Belize and Bolivia are also members of ROSCAS. There is at least one ROSCA operating among employees of the International Monetary Fund in Washington DC, all of whom have Ph.D. degrees!

The tremendous diversity in ROSCAS is the result of numerous individually crafted innovations that have molded this institution to the contours of vastly different societies. Analyses of these innovations shed light on why ROSCAS are so popular and also clarify the role innovations play in financial intermediation. For discussion purposes it is useful to group some of these innovations into three categories: those that substitute for collateral, those that determine how the rotation is carried out, and those that affect transactions costs.

Collateral is often a major sticking point in effecting financial intermediation between surplus (saving) and deficit (borrowing) units. ROSCAS handle this through several types of innovations. This includes only allowing those to be members who are connected by blood, clan ties, or close working relationships. Velez-Ibanez calls this tie "confianza" in Spanish or mutual trust in English. Under these circumstances, members of ROSCAS who borrow and do not fully repay their loans are ostracized by the group. Another collateral innovation is for an organizer of the ROSCA to pay for any defaults by individuals he or she invites to participate. In even more extreme cases, large ROSCAS may use mob-like tactics to enforce contract. This occurred in Thailand a few years ago when a member of a large ROSCA withdrew his pot and

then escaped to the US, only to find that a "contract" had been let for his life.

There are numerous innovations in the way the ROSCA pots are distributed. The simplest technique is to allocate the pot by the order in which the members joined the ROSCA, or to do it by drawing lots when the ROSCA is formed. A more complicated variation is for the organizer to get the first pot and then to allocate subsequent pots by lot. In small groups the allocation may be done on the basis of who needs it most. A more sophisticated allocation technique is to have members who have not received a pot to bid each time for the distribution. The individual who bids the largest discount on what other bidding members must pay to him wins the pot (Nayar).

There are numerous ways ROSCA organizers innovate to reduce the total transactions costs for their members. This includes arranging the distribution to coincide with members' pay days or harvesting periods, having the member who is most centrally located collect the shares, and having a professional ROSCA organizer handle all of the details for a number of ROSCAs.

#### Research on Financial Innovations

Recent research in agricultural production technologies has increased the pace of discovery of these technologies, over what occurs in nature, or over what can be discovered by individual farmers. A rice researcher, for example, is often the creator of a new technology that reduces the average costs of producing rice. By way of contrast, those who do research on financial technologies usually only report what managers of RFMs have created by way of innovations. RFM researchers are more observers of, rather than participants in, the innovation process. The focus of research on RFM innovations is more

to show their effectiveness, to publicize innovations that are most or least successful, and to show how some policies affect the innovation process.

To date, most of the analysis of transactions costs in RFMs has been descriptive (e.g. Nyanin, Cuevas and Graham, Ladman, Ahmed Humeida, IDB, and Zia Ahmed). It has concentrated mainly on measuring the magnitude of these costs, their distribution among RFM participants, and how various policies affect the use of transactions costs as rationing mechanisms. This includes measuring the trade offs between interest rates and transactions costs as rationing mechanisms, and showing how transactions costs vary among formal and informal sources of loans.

Several types of uses have been made of this descriptive research. First, intermediaries often are uncertain about the magnitude of their transactions costs for handling government programs. Research helps them to better manage their institutions and also provides them with ammunition to use in bargaining with government officials or donors when it comes time to set the terms for externally funded programs. Second, policy makers are almost always uninformed about the real costs of projects in rural finance. Careful estimates of these costs help decision makers to allocate resources and to choose projects more carefully.

Third, information on transactions costs provides insights into how efficiently and equitably RFMs are functioning, much like a temperature reading informs a physician about the health of a patient. If RFM participants are incurring substantial total transactions costs, it is likely that relatively few people are being served by these markets and that the quality of services provided to clients will not be robust. Also, if intermediaries are inflicting



extensive transactions costs on non-preferred clients, one can be sure that interest rates are not doing an efficient job of rationing financial services.

A decline in total transactions costs is a sign that intermediaries are successfully innovating, that more people have access to financial services, and that the quality of financial services are increasing. The exception to this is a financial system that is corrupted by politics, spends little time determining creditworthiness of borrowers, and even less effort in collecting patronage loans. Under these circumstances transactions costs for all participants may be low, but loan recovery is also modest.

### Research Priorities

One of the advantages of doing transactions cost research is that it need not be based on large and costly borrower surveys. Because many financial transactions are done on rules of thumb, representative case studies are often sufficient to clarify the nature and magnitude of these costs among different classes of borrowers and lenders. The key issue in doing these case studies is to select examples that are typical of large numbers of transactions.

Research should not be limited to formal financial arrangements. Because funds move easily between formal and informal financial intermediation, one should expect the rule-of-one-price to prevail between these markets for a service of the same quantity and quality. Often wedges between what a formal lender is allowed to charge a borrower through explicit interest rates, and what the informal lender charges, are filled by transactions costs. Research on informal intermediation may also uncover practices, innovations, and types of services that might be emulated by formal intermediaries.

Aside from an expansion in descriptive studies of transactions costs in RFMs, there are at least five other related research areas that might be

stressed: First, because the business of financial intermediation is largely one of processing and analyzing information, computers must play an important role in major cost-reducing innovations. This is particularly true if the intermediary extends and collects large numbers of small short-term loans and also accepts large numbers of small-to-medium sized deposits. The rapidly declining costs of computers will allow virtually every formal financial intermediary to computerize in the next few years. Research could help identify the types of information that should be processed by these systems. Analysis should also be done on the training and maintenance needs that accompany computerization, and identify the hardware and software requirements for various types of intermediaries in RFMs.

Second, because the innovation process is so diffused it is not clear as to the conditions and incentives that retard or facilitate the development of new financial technologies. Research along this line might address questions such as: Which innovations are costs saving for the intermediary, but cost increasing for the system as a whole? What conditions appear to stimulate the discovery and adoption of cost-reducing technologies?

Third, it should be possible to more carefully document the relationship between policies and transactions costs and to make generalizations about these relationships across countries and geographic areas.

Fourth, more research is needed on the relationship between transactions costs and the ability and willingness of the formal financial system to penetrate rural areas and to provide services to new and small borrowers and savers. Is there any systematic relationship between these costs and market penetration across countries?

Fifth, more information is needed on how deposit services help to increase or decrease transactions costs. Is it possible to build a viable RFM that has low transactions costs and extensive penetration in rural areas without having most of the formal financial intermediaries involved in collecting deposits?

### Conclusions

Over the past 30 years many governments have tried to force formal rural financial markets to extend their services more deeply into rural areas and to also service poor people. While many RFMs have built more banks and cooperatives in rural areas, and sharply increased the amount of funds lent, only a small proportion of the poor households in low income countries have access to dependable formal financial services. We conclude that it will be difficult and costly to substantially increase this coverage through targeted credit programs. Financial intermediaries resist providing more services in rural areas largely because of the costs involved in doing so, and many rural households refrain from using formal financial services because of their high costs, low returns, or poor quality. Substantially reducing transactions expenses through cost-reducing technologies should be a major element in future strategies aimed at getting RFMs to service more people.

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